

UNITED STATES PATENT AND TRADEMARK OFFICE

**CERTIFICATE OF CORRECTION**

PATENT NO. : 7,153,257 B2  
DATED : December 26, 2006  
INVENTOR(S): SCHNEIDER et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 3

Line 1, delete "ossicies" and insert therefor --ossicles--.

Column 18

Line 56, delete "sunportedly" and insert therefor --supportedly--.

MAILING ADDRESS OF SENDER:

Thomas R. Marsh, Esq.

Registration No. 31,039

MARSH FISCHMANN & BREYFOGLE LLP

3151 South Vaughn Way, Suite 411

Aurora, Colorado 80014

Telephone: 303-338-0997

Facsimile: 303-338-1514

PATENT NO. 7,153,257 B2

According to one feature of the subject aspect, the rotatable portion of the transducer housing may be configured for rotation within a cavity of the mounting apparatus. This in turn permits orientation of transducer components, e.g. the actuator, for interfacing with an auditory component of a patient, e.g. the ossicles. The cavity 5 may be a substantially enclosed cavity, e.g. enclosed on all but one side, or alternatively may be defined by at least two opposing portions, e.g. two substantially rounded portions, rotatably mateable with the rotatable portion of the transducer housing. According to this characterization, the orientation may include rotating the rotatable portion of the transducer housing within the cavity to align an actuator or actuator 10 intercept axis with a desired interface point on the auditory component.

The rotatable portion of the transducer housing may be of any geometric shape or configuration that is rotatable relative to the mounting apparatus cavity. For instance, the rotatable portion of the transducer housing may comprise a rounded housing surface. In another instance, the rotatable portion of the transducer housing may 15 comprise a substantially round surface having a plurality of faucets or faces, such as on a diamond. According to this characterization, as the portion of the transducer housing is rotated, each face may operate to positionally fix the housing along a continuum of positions defined by the faucets. In another instance, the entire transducer housing may be configured for rotation, e.g. rounded. In another instance, the rotatable portion 20 of the transducer housing may include substantially rounded opposing portions to permit rotation within the cavity. In this case, the substantially rounded opposing portions may have the same or a variety of different arc lengths or radii.

According to another feature of the present aspect, the actuator may be advanceable relative to the transducer housing to facilitate interfacing with the auditory 25 component. For example, the actuator may be a separate structure from the transducer housing that is selectively connectable to the transducer housing. In this regard, the transducer housing may include an aperture defined therein from a first end to a second end for receiving the actuator. According to this characterization, the actuator may be designed for insertion through the aperture in the transducer housing, where it may be 30 positioned proximate or adjacent to the ossicles of a patient for interfacing with a

## PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

) Group Art Unit: 3735

SCHNEIDER, et al.

) Examiner: Samuel G. Gilbert

Serial No.: 10/821,447

## AMENDMENT AND RESPONSE

Filed: April 9, 2004

**ANSWER** The answer is **100**.

Confirmation No.: 1347

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE.

Atty. File No.: 45568-00451

VA 22315-1430 ON ~~ALL INFORMATION CONTAINED~~  
MARSH FISCHMANN & BREYFOGLE LLP

For: "IMPLANTABLE HEARING AID  
TRANSDUCER SYSTEM"

By *John E. G.*

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

BY: Lori Lane

Dear Sir:

— 17 —

Dear Sir:

Applicant submits this Amendment and Response to address the Office Action having a mailing date of October 17, 2005. Also enclosed is a check in the amount of \$75.00 as the fee for the additional claims presented herein and a check in the amount of \$510.00 to cover the cost of a petition for a 3-month extension. Please credit any overpayment or charge any underpayment to Deposit Account No. 50-1419.

Please amend the above-identified patent application as follows:

IN THE CLAIMS:

1. (Presently Amended) An implantable hearing aid transducer mountable to a transducer mounting apparatus, the transducer comprising:

an actuator to stimulate an auditory component;

a driver comprising at least one magnet and one coil; and

a transducer housing having a rotatable portion rotatable in three dimensions, said rotatable portion supportedly housing at least a portion of one of the magnet and the coil of the driver, wherein at least part of the rotatable portion of the transducer housing is rotatable within and relative to a cavity of a transducer mounting apparatus, and wherein during three-dimensional rotation of the rotatable portion of the transducer housing a center of rotation of the rotatable portion of the transducer housing remains positionally fixed.

2. (Presently Amended) The transducer of Claim 1 wherein the center of rotation of the rotatable portion of the transducer housing is [rotatable] located within [a] the cavity of the transducer mounting apparatus.

3. (Original) The transducer of Claim 1 wherein the transducer housing includes an aperture extending through at least a first side thereof, and wherein the actuator is advanceable through the aperture to interface with the auditory component.

4. (Original) The transducer of Claim 3 wherein the rotatable portion of the transducer housing is rotatable to align one of an actuator axis and the aperture with a desired interface point on the auditory component.

5. (Presently Amended) The transducer of Claim 1 wherein the actuator is detachably connectable to the transducer housing along a continuum of [vertical] linearly disposed positions.

6. (Original) The transducer of Claim 1 wherein the rotatable portion of the transducer housing is substantially rounded for rotation relative to the transducer mounting apparatus.

7. (Original) The transducer of Claim 1 wherein the rotatable portion of the transducer housing is selectively securable to the mounting apparatus along a continuum of angular orientations.

8. (Original) The transducer of Claim 3 wherein the actuator is a separate structure from the transducer housing that is insertable into and advanceable through the aperture.

9. (Original) The transducer of Claim 3 wherein the aperture extends through a second side of the transducer housing.

10. (Original) The transducer of Claim 9 comprising:  
a tube movably connected within the aperture and configured to receive the actuator.

11. (Original) The transducer of Claim 1 wherein at least one of the coil and the magnet is hermetically sealed within the transducer housing.

12. (Original) The transducer of Claim 1 wherein at least one of the coil and the magnet is connected to the actuator in a hermetically sealed manner.

13. (Original) The transducer of Claim 10 comprising:  
a spring washer connecting the tube within the aperture in a movable manner.

14. (Original) The transducer of Claim 10 wherein when the actuator is detachably connectable to the tube and the tube and actuator are movable by the driver relative to the transducer housing.

15. (Presently Amended) A method for implanting a hearing aid transducer within a patient, the method comprising:

attaching a transducer mounting apparatus to a patient's skull;  
[using the mounting apparatus,] supporting at least part of a rotatable portion of a transducer housing within a cavity of the mounting apparatus, wherein the rotatable portion is rotatable in three dimensions and encloses at least a portion of a transducer driver; and  
rotating in three dimensions the rotatable portion of the transducer housing relative to the mounting apparatus to orient the transducer for interfacing with an auditory component, wherein during the rotating step, a center of rotation of the rotatable portion remains positionally fixed.

16. (Presently Amended) The method of Claim 15 wherein the supporting step comprises [supporting] locating the center of rotation of the rotatable portion within [a] the cavity of the mounting apparatus, and the rotating step comprises rotating the rotatable portion within the cavity to a desired orientation relative to the auditory component.

17. (Original) The method of Claim 15 wherein the rotating step comprises:  
aligning at least one of an actuator axis and an aperture in the transducer housing with a desired interface point on the auditory component.

18. (Original) The method of Claim 16 the method comprising:  
securing the rotatable portion of the transducer housing in the desired orientation relative to the auditory component.

19. (Original) The method of Claim 18 wherein the securing step comprises:  
securing the rotatably portion of the transducer housing in the desired orientation in a detachable manner.

20. (Original) The method of Claim 17 the method comprising:  
inserting an actuator through the aperture in the transducer housing; and  
advancing the actuator through the aperture to interface the actuator with the auditory component.

21. (Original) The method of Claim 20 the method comprising:  
interfacing the actuator with the auditory component; and  
securing the actuator to the transducer housing.

22. (Presently Amended) A transducer system comprising:  
a mounting apparatus attachable to a patient's skull;  
a driver comprising at least one magnet and one coil;  
a transducer housing having a rotatable portion rotatable in three dimensions, said  
rotatable portion supportedly housing at least a portion of one of the magnet and the coil of the  
driver, wherein at least part of the rotatable portion of the transducer housing is rotatable within and  
relative to a cavity of a transducer mounting apparatus, and wherein during three-dimensional  
rotation of the rotatable portion of the transducer housing a center of rotation of the rotatable portion  
of the transducer housing remains positionally fixed; and  
a retention apparatus to selectively secure the rotatable portion of the transducer  
housing relative to the mounting apparatus.

23. (Original) The transducer system of Claim 22 wherein the rotatable portion of the  
transducer housing is selectively securable to the mounting apparatus along a continuum of angular  
orientations.

24. (Presently Amended) The transducer system of Claim 22 wherein the center of  
rotation of the rotatable portion of the transducer housing is located with the cavity of the mounting  
apparatus [defines a cavity for receiving the rotatable portion of the transducer housing therein.]

25. (Original) The transducer system of Claim 22 wherein the rotatable portion of the  
transducer housing is rotatable within the cavity to align one of an aperture in the transducer housing  
and an actuator axis with a desired interface point on an auditory member.

26. (Original) The transducer system of Claim 22 wherein the rotatable portion of the transducer housing is rounded for rotation relative to the mounting apparatus.

27. (Original) The transducer system of Claim 22 wherein the retention apparatus is selectively movable between a locked and unlocked position.

28. (Original) The transducer system of Claim 27 wherein the rotatable portion of the transducer housing is rotatable, upon application of a predetermined amount of force, relative to the mounting apparatus, when the retention apparatus is in the locked position.

29. (Original) The transducer system of Claim 27 wherein the retention apparatus comprises:

a retaining member;

at least one guide on the retaining member movable along a predetermined path of travel in the mounting apparatus between an unlocked and a locked position; and

a resilient member compressible between the retaining member and a rotatable member to capture the rotatable member in a desired orientation relative to an auditory component when the retention apparatus is in the locked position.

30. (Original) A method for implanting a hearing aid transducer within a patient, the method comprising:

angularly orienting the transducer relative to a transducer mounting apparatus using rotational movement of a rotatable portion of a transducer housing; and

vertically orienting the transducer using an actuator advanceable relative to the transducer housing; and

interfacing the actuator with an auditory component.

31. (Original) The method of Claim 30 wherein the angularly orienting step comprises:

rotating the rotatable portion of the transducer housing within a cavity of the mounting apparatus.

32. (Original) The method of Claim 30 the method comprising:  
securing the rotatable portion of the transducer housing within the mounting apparatus  
in the desired angular orientation.
33. (Original) The method of Claim 32 wherein the vertically orienting step comprises:  
inserting an actuator through an aperture in the transducer housing; and  
advancing the actuator through the aperture to interface the actuator with the auditory  
component.
34. (Original) The method of Claim 30 the method comprising:  
connecting the actuator to the transducer housing.
35. (New Claim) The transducer of Claim 1, wherein the other one of said magnet and  
said coil is interconnected to said actuator for comovement therewith.
36. (New Claim) The method of Claim 17, wherein another portion of said transducer  
driver is interconnected to said actuator for comovement therewith.
37. (New Claim) The transducer system of Claim 22, wherein the other one of said  
magnet and said coil is interconnected to said actuator for comovement therewith.

## REMARKS

In the Office Action mailed October 17, 2005, the Claims 15-19, 22-32 and 34 were rejected under 35 U.S.C. § 102(b) based on U.S. Patent No. 5,702,342 to Metzler et al., Claims 1, 2, 6 and 7 were rejected under 35 U.S.C. § 103(a) based on Metzler in view of U.S. Patent No. 5,456,654 to Ball, and Claims 3, 4, 8, 11 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable based on Metzler, et al. in view of Ball and further in view of U.S. Patent No. 6,491,622 to Kasic, et al. Further, Claims 5, 9, 10, 13, 14, 20, 21 and 33 were indicated as being allowable if rewritten in independent form to include the limitations of the claims from which they correspondingly depend.

Applicant submits that all pending claims are allowable.

In this regard, independent Claim 1 is directed to an implantable hearing aid transducer mountable to a transducer mounting apparatus, and comprises an actuator, a driver comprising at least one magnet and one coil, and a transducer housing having a portion that is rotatable in three dimensions and supportedly houses at least a portion of one of the magnet and coil of the driver, wherein at least part of the rotatable portion is rotatable within and relative to a cavity of a transducer mounting apparatus, and wherein during three-dimensional rotation of the rotatable portion a center of rotation thereof remains positionally fixed. Applicant submits that the prior art neither discloses nor renders obvious the invention of Claim 1.

For example, Metzler et al. fails to disclose, *inter alia*, an arrangement in which at least a portion of a transducer housing houses at least a portion of a magnet or coil of a driver, wherein at least part of the rotatable portion is rotatable within and relative to a cavity of a transducer mounting apparatus, much less wherein during three-dimensional rotation a center of rotation of the rotatable portion remains positionally fixed. Rather, and a clear contrast to the arrangement of Claim 1 in the present Application, Metzler et al. teaches:

"[A] transducer 62 mounted on [a] first end portion 50 of [a] mounting post 48 [that] extends beyond [a] primary casing 12 ... such that lead 65 of transducer 62 extends into the middle ear." (Emphasis added) Column 4, lines 41-43.

In this regard, it seems clear that the mounting post 48 of Metzler, et al. should not be considered as part of a "transducer housing" and does not, in any case, house any portion of a magnet or coil of a driver. Further, Applicant submits that Metzler et al. actually teaches away from locating any portion of a magnet or coil of a driver within a rotatable housing portion having at least a part thereof that is rotatable within and relative to a cavity of a transducer mounting apparatus.

Ball fails to disclose, *inter alia*, a transducer housing having any rotatable portion, much less a rotatable portion that includes a part that is rotatable within and relative to a cavity of a transducer mounting apparatus. In fact, Ball is directed to various arrangements in which a transducer 100 comprising a housing 10 is "affixed to various [physiological] structures within the ear." See e.g. Column 5, lines 14 and 15. That is, absolutely no interface is contemplated between a transducer housing and a transducer mounting apparatus. Rather, Ball specifically teaches that:

"The transducer 100 must be connected substantially exclusively to the ossicles DD or the oval window EE." (Emphasis added) Column 5, lines 27 and 28.

Applicant submits that not only does Ball fail to disclose or otherwise suggest the invention of Claim 1, but actually teaches away from such an arrangement.

In addition to the foregoing shortcomings of Metzler et al. and Ball, Applicant submits that such references cannot be properly combined to disclose or otherwise render obvious the invention of Claim 1. In this regard, and as noted above, each of the arrangements of Metzler et al. and Ball

actually teach away from Applicant's invention. Further, the respective teachings clearly teach away from any combination thereof, e.g. given the direct ossicular or oval window attachment requirements of Ball. Additionally, and in any case, even if Metzler and Ball were inappropriately combined, the resulting combination would not yield the invention of Claim 1 given the above-noted shortcomings of each.

In view of the foregoing, Applicant submits that Claim 1 is allowable over the art. Further, Applicant submits that dependent Claims 2-14 and 35 are allowable for the same reasons as independent Claim 1, and additionally since such claims present further combinative features not disclosed or otherwise rendered obvious by the prior art.

As to independent Claims 15 and 22, Applicant submits that such Claims are allowable over Metzler et al. and Ball for reasons at least partially analogous to those set forth in regard to independent Claim 1. Further, Applicant submits that Claims 16-21 and 36, and 23-35 and 37 dependent upon independent Claims 15 and 22, respectively, are allowable for corresponding

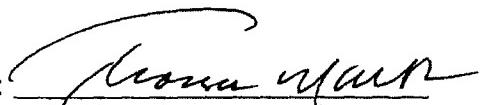
reasons, and further submits such Claims present further combinative features not disclosed or rendered obvious by the prior art.

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

MARSH FISCHMANN & BREYFOGLE LLP

By:

  
Thomas R. Marsh  
Registration No. 31,039  
3151 South Vaughn Way, Suite 411  
Aurora, Colorado 80014  
(303) 338-0997

Date: April 13, 2006